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The lateral line is closely associated with the air, and may also assist at hearing. The ear is an outgrowth from the tubes of the lateral line. As Professor Parker aptly observes, in the skin, the lateral line and the ear, "we are dealing with what may be called three generations of sense organs: the skin representing the first generation and giving rise to the lateral line organs, the second, which in turn produce the ears."

D. S. J.

**Parker on the Optic Nerves of Flounders.**<sup>1</sup>—In the bony fishes, the optic nerves pass to the optic lobes of the brain, the one passing to the lobes of the opposite side simply lying over the other, without intermingling of fibres, such as takes place in the higher vertebrates and in the more primitive fishes.

According to Parker's observations, in ordinary bony fishes, the right nerve may be indifferently above or below the other. In 1000 specimens of ten common species, 486 have the left nerve uppermost and 514 the right nerve. In most individual species, the numbers are practically equal. Thus, in the haddock, 48 have the left nerve uppermost and 52 the right nerve.

In the unsymmetrical Teleosts or flounders, and soles, this condition no longer obtains. In those species of flounder with the eyes on the right side, 236 individuals representing sixteen species had the left nerve uppermost in all cases.

Of flounders with the eyes on the left side, 131 individuals representing nine species all have the right nerve uppermost.

There are a few species of flounders in which reversed examples are so common that the species may be described as having the eyes on the right or left side indifferently. In all these species, however, whether dextral or sinistral, the relation of the nerves conforms to the type, and is not influenced by the individual deviation. Thus the stony flounder (*Platichthys*) belongs to the dextral group. Fifty normal specimens, the eyes on the right, have the left nerve dorsal, while the right nerve is also uppermost in 50 reversed examples with eyes on the left. In 15 examples of the California bastard halibut (*Paralichthys californicus*) normally sinistral, the right eye is always uppermost. It is uppermost in 11 reversed examples.

<sup>1</sup>Parker, G. H. The Optic Chiasma in Teleosts and its Bearing on the Asymmetry of the Heterosomata (Flat Fishes) *Bull. Mus. Comp. Zool.*, Vol. XL, No. 5, pp. 221-242, 1 pl.

Among the soles this uniformity or monomorphism no longer obtains. In forty-nine individuals of four species of dextral soles, the left nerve is uppermost in 24, the right nerve in 25. Among sinistral soles, or tongue fishes, in 18 individuals of two species, the left nerve is uppermost in 13, the right nerve in 5.

Professor Parker concludes from this evidence that soles are not degenerate flounders, but rather descended from primitive flounders which still retain the demorphic condition as to the position of the optic nerves, a condition still retained by all bony fishes except the flounders.

The lack of symmetry among the flounders lies therefore deeper than the matter of the migration of the eye. The asymmetry of the mouth is an independent trait, but like the migration of the eye, is an adaptation to swimming on the side. Each of the various traits of asymmetry may appear independently of the others.

The development of the monomorphic arrangement in flounders, Professor Parker thinks, can be accounted for by the principle of natural selection. In a side-swimming fish, the fixity of this trait has a mechanical advantage. The unmetamorphosed young of the flounder are not strictly symmetrical, for they possess the monomorphic position of the optic nerve. The reversed examples of various species of flounders (these, by the way, chiefly confined to the California fauna) afford "striking examples of discontinuous variation."

Professor Parker inclines to the opinion that the ancestral flounders were allied to the john dories. This is as plausible a guess as any. They certainly have no affinity with the cod-fishes.

D. S. J.

**Notes on Recent Fish Literature.**—Mr. C. T. Regan (*Proc. Zool. Soc. London*) takes up the osteology of the plectognathous fishes and the classification derived from it. The chief character of the group as distinguishing it from their ancestors, the Acanthuridæ is the absence of ribs. He divides the plectognaths into two divisions, the Sclerodermi and the gymnodontes. To the former group the Ostracodermi are referred. The supposed families of Chonerhinidæ and Tropedecheybidæ are regarded as not distinct from Tetraodontidæ and doubt is thrown on the accuracy of the figures of Hollard which have served as the basis for certain generic distinctions.

The Mexican trigger-fish *Balistes naufragium* is said to be a species of Xanthichthys, a genus rejected by Mr. Regan.